

**REMARKS**

Claims 9, 11 and 12 are pending in this application. Claim 9 has been amended to correct the manifest typographical oversight noted by the Examiner. Manifestly, the present Amendment does not generate any new matter issue or any new issue for that matter. Moreover, for reasons which will appear apparent, the imposed rejection under 35 USC §103 is not factually or legally viable.

**Claim Objection**

The Examiner objected to claim 9 identifying a typographical oversight. As noted above, claim 9 has been amended to address the typographical oversight identified by the Examiner, thereby overcoming the stated basis for the objection. Withdrawal of the claim objection is, therefore, solicited.

**Claims 9, 11 and 12 were rejected under 35 USC §103 for obviousness predicated upon Yano et al. in combination with Sato and Tottori.**

In the statement of rejection, the Examiner appears to have relied upon Sato as the primary reference, admitting that Sato does not disclose various sequential steps involved in forming the second and third interlayers with openings which, of course, constitute significant aspects of the present invention. The Examiner then concluded that one having ordinary skill in the art would have been motivated to modify Sato's methodology by impressing therein the teachings of Yano et al. with respect to forming the second and third interlayer insulating films with openings therein, and to employ a polycrystalline silicon film in view of Tottori. This rejection is traversed.

### **Factual Differences**

In accordance with the present invention, a **first** interlayer insulating film is formed on the semiconductor substrate. Manifestly, layer 101 in Sato's methodology is a metal layer. Accordingly, there must be an interlayer insulating film between that metal layer 101 and the substrate. Therefore, layer 102 is not the first interlayer insulating film formed on a semiconductor substrate.

Secondly, the plug formed by Sato is not equivalent to the conductive plug of the claimed invention because it electrically connects two metal connection layers as shown in Fig. 4. Ergo, even if the applied references are combined, the claimed invention would not result. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988). Moreover, and quite significant, there is no motivation for combining the applied references as set forth below.

### **There is no motivation**

In order to establish the requisite motivation, the Examiner must point to a **source** in the applied prior art for **each** claim limitation and a **source** in the applied prior art for the requisite **motivational** element. *Smiths Industries Medical System v. Vital Signs Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999). More to the point, the Examiner is required to make a "thorough and searching" factual inquiry and, based upon that factual inquiry and, based upon that factual inquiry, explain **why** one having ordinary skill in the art would be realistically impelled to modify particular prior art, in this case Sato's method, to arrive at the claimed invention. *In re Lee*, 237 F.3d 1338, 61 USPQ2d 1430,

1433 (*Fed. Cir. 2002*). Such a factual inquiry requires clear and particular factual findings as to a specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify Sato's method to arrive at the claimed invention. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (*Fed. Cir. 2000*); *Ecolchem Inc. v. Southern California Edison, Co.* 227 F.3d 1361, 56 USPQ2d 1065 (*Fed. Cir. 2000*); *In re Kotzab*, 217 F.3d 1365, 55 USPQ 1313 (*Fed. Cir. 2000*); *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (*Fed. Cir. 1999*). Merely identifying wherein features of a claimed invention are perceived to reside in disparate references does not establish the requisite motivation. *In re Kotzab, supra*; *Grain Processing Corp. v. American-Maize Products Co.*, 840 F.2d 902, 5 USPQ2d 1788 (*Fed. Cir. 1988*). Rather, a **specific reason** must be offered based upon **facts** to support the asserted motivation--not generalizations. *Ecolchem Inc. v. Southern California Edison, Co. supra*; *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (*Fed. Cir. 1998*).

In applying the above legal tenets to the exigencies of this case, Applicants submit that the requisite motivation element has **not** been established. Specifically, there are several reasons which undermine the Examiner's asserted motivation.

Firstly, in making a "thorough and searching" factual inquiry, as judicially required, it is significant to note the problem addressed by Sato et al., as illustrated in Figs. 6A-6C, resides in the formation of an indentation 110 in the upper connection 108 and the depression 109. *In re Lee, supra*. This particular problem addressed by Sato generates wiring resistance. But that particular problem does not occur using the technique of Yano et al., the allegedly teaching reference, because the plugs are formed after all the wiring layers are in place. Hence, there is **no reason why** one having

ordinary skill in the art would have been realistically impelled to combine these references in the manner suggested by the Examiner. *In re Lee supra*.

Secondly, as previously pointed out, Sato's plug provides electrical connection between two immediate connection lines as shown in Fig. 4. **If** the methodology of Yano et al. et al. is impressed upon the teachings of Sato, and that is a big **if** with which Applicants do not agree, the claimed invention would not result, because the claimed invention requires forming a plurality of openings to penetrate second and third interlayer insulating films, each of which have a wiring pattern thereon, and then forming a plurality of interconnect conductors to be electrically connected to each of the conductor plugs. *Uniroyal, Inc. v. Rudkin-Wiley Corp., supra*.

It is apparent that the Examiner's motivation is predicated upon an improper generalization as to combining the teachings of the references. However, in order to establish the requisite motivation, the Examiner is required to make clear and particular factual findings as to a specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to combine the applied references in a specific manner to arrive at a specifically claimed invention. *Ruiz v. A.B. Chance Co., supra; Ecolochem Inc. v. Southern California Edison, Co. supra; Kotzab, supra and Dembiczak, supra*. That burden has not been discharged.

Looked upon in another way, Sato's methodology and the methodology of Yano et al. are incompatible. Yano et al. require a formation of a plug from the third interlayer insulating film to the substrate. See, for example, Figs. 1(e) and 1(f), and the related discussions thereof. Again, the wirings are formed prior to forming the plug. Not so in

Sato's methodology which requires first forming wiring layer 101, forming the plug 106, and then forming the upper wiring layer 108. However, Yano et al. require forming all of the wiring layers and then drilling the contact holes, and then forming the plugs in one step. The methods are completely incompatible. Any attempt to merge these incompatible methods would not result in the claimed invention which requires the formation of forming a conductive plug in the first interlayer insulating film, forming a second interlayer insulating film thereon, forming a wiring pattern on the second interlayer insulating film, forming a third interlayer insulating film, forming a plurality of openings penetrating the second and third interlayer insulating films, forming the conductive plugs, and then forming a plurality of interconnect conductors in the openings in the second and third insulating films electrically connected to each of the conductive plugs in the first insulating film. How that method can be divined from the teachings of Yano et al. and Sato, even by combining these references, has not been articulated on this record with technological reasoning. The tertiary reference to Tottori does not cure the argued deficiencies of Yano et al. and Sato.

#### **Evidence of Non-obviousness**

**Applicants would rely upon Yano et al as evidence of non-obviousness because Yano et al. teach away from the claimed invention.** Specifically, Yano et al. teach away from forming lower plugs and then forming wiring layers thereon. Yano et al. specifically teach that all of the wire layers should be placed prior to drilling holes and filling the holes to form plugs connecting the various wiring layers. This clear teaching away from the claimed invention by the Examiner's own teaching reference constitutes a potent indicium of

non-obviousness. See, for example, *In re Bell*, 991 F.2d 781, 26 USPQ2d 1529 (Fed. Cir. 1993); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 6 USPQ2d 1601 (Fed. Cir. 1988); *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986); *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983); *In re Marshall*, 578 F.2d 301, 198 USPQ 344 (CCPA 1978).

### **Conclusion**

Based on the foregoing, Applicants submit that a prima facie basis to deny patentability to the claimed invention under 35 USC §103 has not been established for lack of the requisite factual basis and want of the requisite realistic motivation. Moreover, even if the applied references to Sato and Yano et al. are combined, the claimed invention would not result. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, *supra*. Furthermore, upon giving due consideration to the evidence of non-obviousness stemming from the teaching away from the claimed invention by Yano et al., the conclusion appears inescapable that one having ordinary skill in the art would **not** have found the claimed invention **as a whole** obvious with any meaning of 35 USC §103. *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984).

Applicants, therefore, submit that the imposed rejection of claims 9, 11 and 12 under 35 USC §103 for obviousness predicated upon Yano et al. in combination with Sato and Tottori is not factually or legally viable and, hence, solicit withdrawal thereof.

It should, therefore, be apparent that the objection and rejection have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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